FIG. 1

Key:

● = neutral sample atom or molecule

⊕ = positively ionized neutral atom or molecule of sample

ⓔ = secondary electron associated with ionization event

z = distance from "stop" detector (parallel to the central axis of the drift region)

d = distance ion travels in drift region

V_1 = voltage at "Stop" end of the drift tube

V_2 = voltage at opposite end of drift tube ($V_1 < V_2$)

sample inlet

Continuous Ionizing Radiation Source (e.g.,planar beam of electrons, ions, UV, etc)

"Start" Detector

"Stop" Detector

Signal Out (t_1)

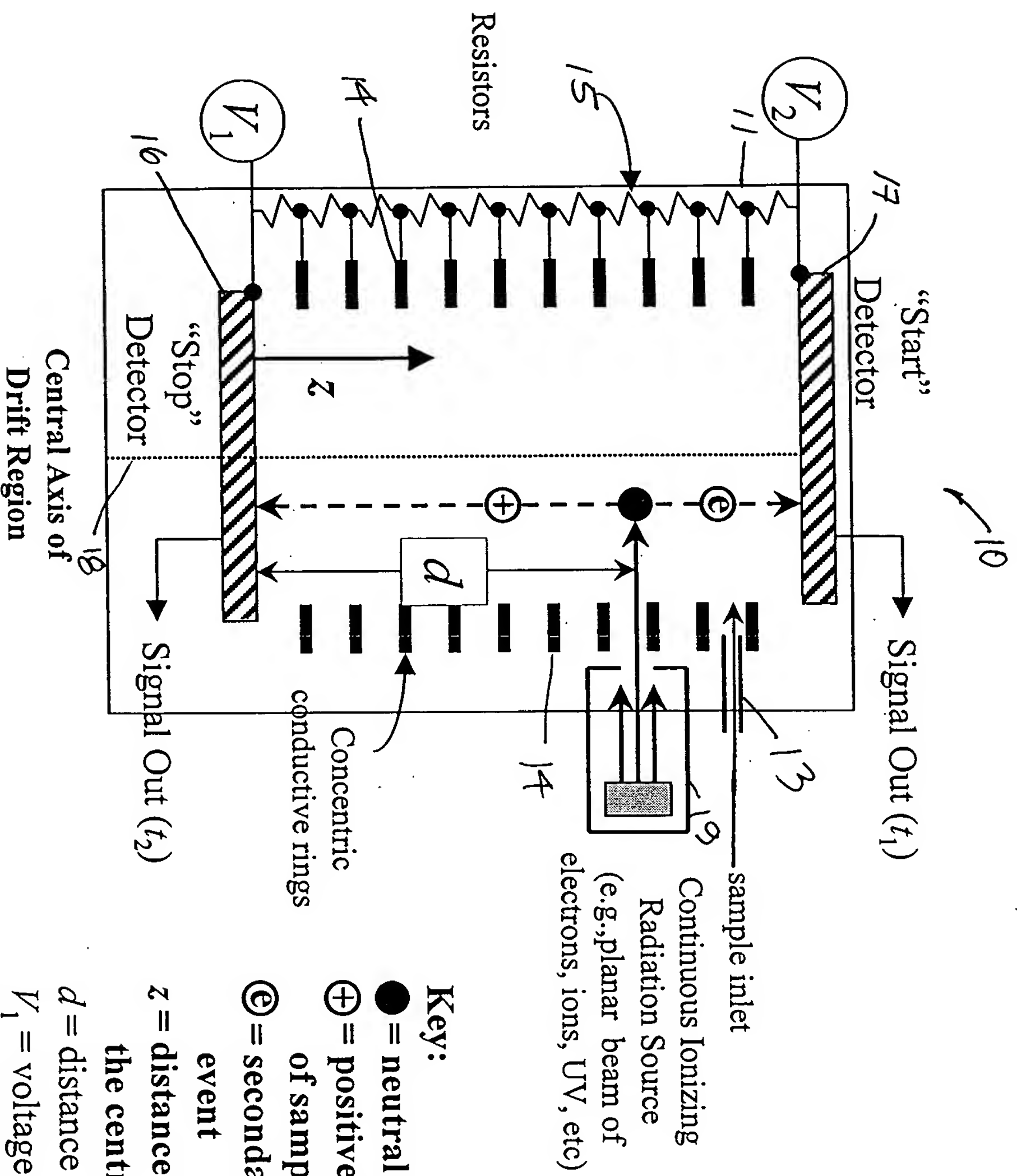Signal Out (t_2)

V_1

V_2

FIG. 2

Key:

● = neutral sample atom or molecule

⊕ = positively ionized neutral atom or molecule of sample

Ⓔ = secondary electron associated with ionization event

z = distance from "stop" detector (parallel to the central axis of the drift region)

d = distance ion travels in drift region

V_1 = voltage at "Stop" end of the drift tube

V_2 = voltage at opposite end of drift tube ($V_1 < V_2$)
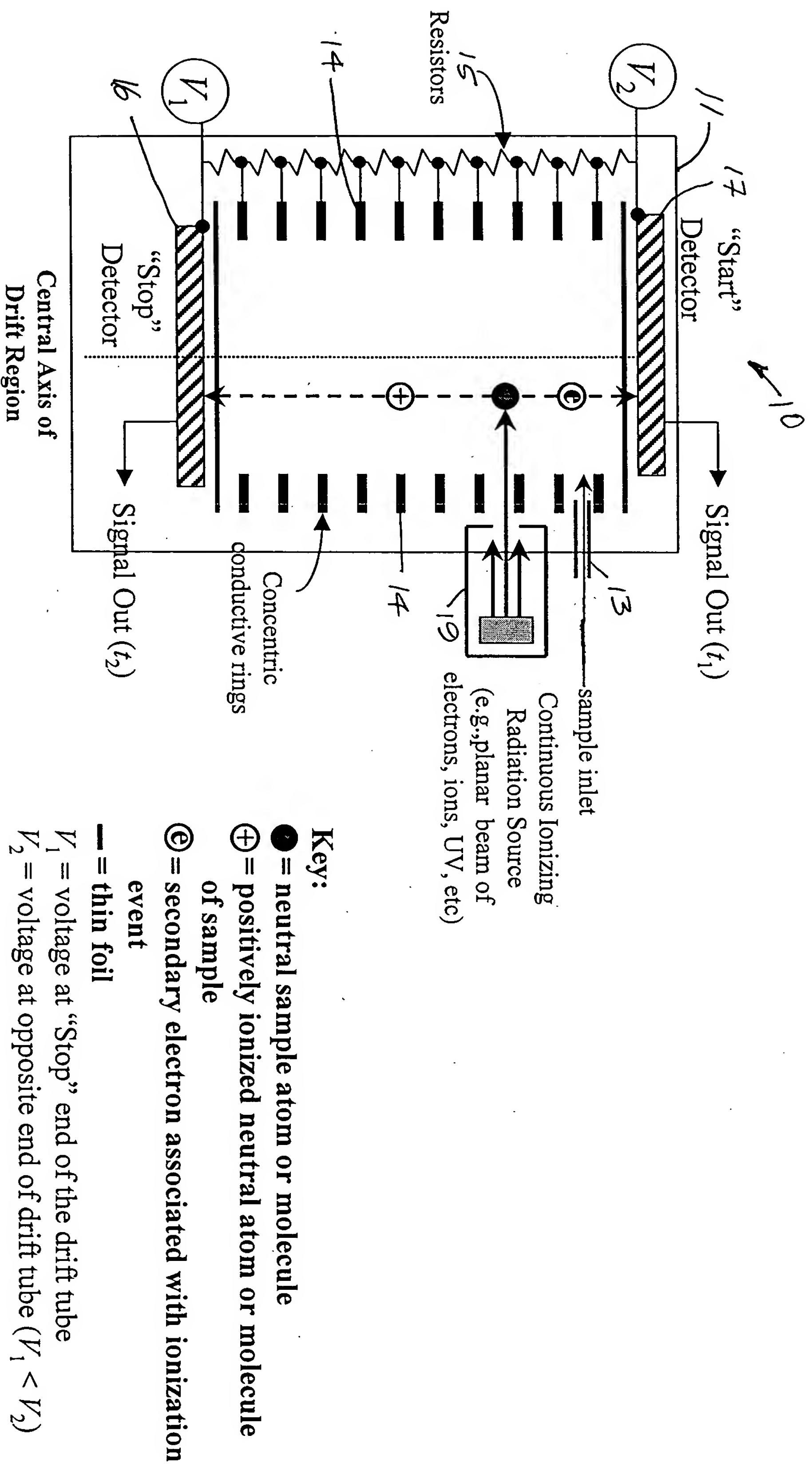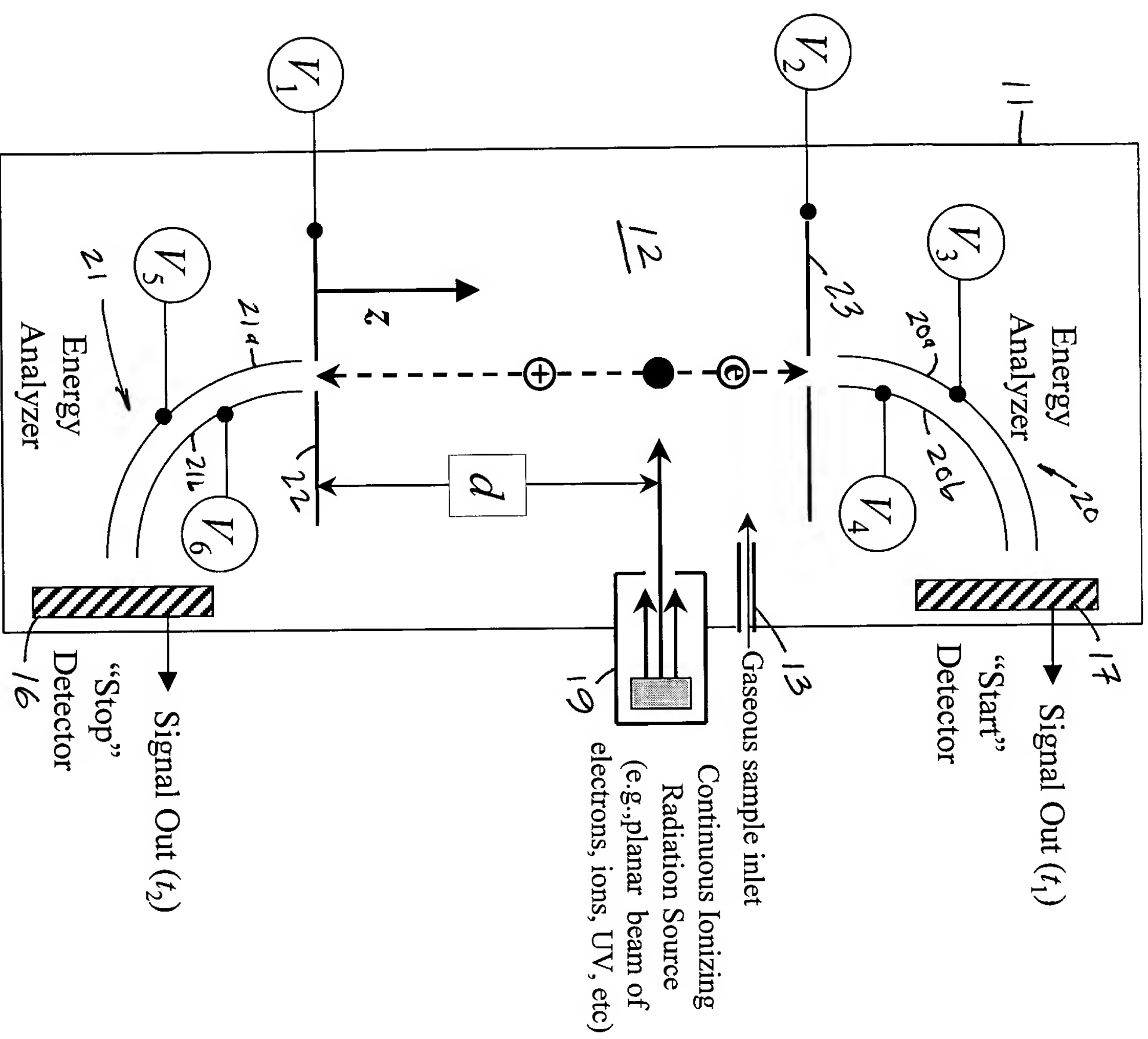
FIG. 3

Key:
● = neutral sample atom or molecule
⊕ = positively ionized neutral atom or molecule of sample
ⓔ = secondary electron associated with ionization event
— = thin foil
V_1 = voltage at "Stop" end of the drift tube
V_2 = voltage at opposite end of drift tube ($V_1 < V_2$)

FIG. 4

Key:

● = neutral sample atom or molecule

⊕ = positively ionized neutral atom or molecule of sample

ⓔ = secondary electron associated with ionization event

z = distance from "stop" detector (parallel to the central axis of the drift region)

d = distance ion travels in drift region

V_1 = voltage at "Stop" end of the drift tube

V_2 = voltage at opposite end of drift tube $(V_1 < V_2)$

V_3, V_4 = Electrostatic energy analyzer voltages